

**Remarks:**

Reconsideration of the application is respectfully requested.

Claims 1, 2, 4, 10, 12, and 14 - 16 are pending. Claims 3, 5-9, 11, 13, and 17-23 were previously canceled. As it is believed that the claims were patentable over the cited art as previously presented, the claims have not been amended herein to overcome the references.

In item 2 of the above-identified Office Action, claims 1, 2, 4, 10, 12 and 14 - 16 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U. S. Patent No. 6,177,351 to Beratan et al ("**BERATAN**").

Applicants respectfully traverse the above rejections.

More particularly, Applicants' sole independent claim 1 recites, among other limitations:

**a barrier layer provided over said base substrate,**  
said barrier layer including an oxygen-containing  
iridium layer and an oxygen barrier layer, said oxygen  
barrier layer being composed of one of iridium dioxide  
and ruthenium dioxide; [emphasis added by Applicants]

That the barrier layer is provided over the base substrate can be seen, more particularly in Fig. 1C of the instant application, which shows the oxygen barrier layer 30 over the base substrate 5. In contrast to Applicants' claimed

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invention, the **BERATAN** reference fails to teach or suggest, among other limitations of Applicants' claims, a barrier layer **provided over the base substrate 300 of BERATAN**. First, Applicants note that the Office Action points to the bottom electrode "304" as allegedly forming a "barrier layer" as claimed in Applicants' claim 1. Applicants respectfully disagree. More particularly, the bottom electrode 304 of **BERATAN** is not a "barrier layer", as claimed by Applicants', but rather, is the bottom electrode of the device.

The **BERATAN** reference does disclose a barrier layer 308. However, the barrier layer 308 of **BERATAN** is not provided over the base substrate 300, 302 of BERATAN. Rather, in **BERATAN**, the barrier layer 308 of **BERATAN** is provided within trenches/openings formed in an interlayer dielectric 302 of **BERATAN**, which is formed on the substrate 300 of **BERATAN**. This can be seen from Fig. 3 of **BERATAN**, as well as from col. 6 of **BERATAN**, lines 6 - 46.

As such, among other limitations of Applicants' claims, **BERATAN** fails to teach or suggest a barrier layer provided over the base substrate, as required by Applicants' claim 1.

Additionally, Applicants' independent claim 1 recites, among other limitations:

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a barrier layer provided over said base substrate,  
said barrier layer including an oxygen-containing  
iridium layer and an oxygen barrier layer, said oxygen  
barrier layer being composed of one of iridium dioxide  
and ruthenium dioxide; [emphasis added by Applicants]

As such, Applicants' particularly claimed barrier layer includes an oxygen containing iridium layer and an oxygen barrier layer composed of one of iridium dioxide or ruthenium dioxide. In contrast to Applicants' claimed invention, the barrier layer 308 of **BERATAN** does not include Applicants' particularly claimed composition. More particularly, the composition of the barrier layer of **BERATAN** is disclosed in col. 4 of **BERATAN**, lines 42 - 64. However, nothing in **BERATAN** teaches or suggests, among other limitations of Applicants' claims, that the barrier layer of **BERATAN** includes an oxygen containing iridium layer and an oxygen barrier layer composed of one of iridium dioxide or ruthenium dioxide, as required by Applicants' claim 1. Rather, page 3 of the Office Action again points to the composition of the bottom electrode 304 of **BERATAN** as teaching the above-discussed limitation of Applicants' claims. However, it is clear that an electrode (i.e., the electrode 304 of **BERATAN**) is not an oxygen-containing barrier layer, as required in Applicants' claims.

Further, Applicants' claim 1 requires, among other limitations:

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**an adhesion layer disposed between said base substrate and said barrier layer**, said adhesion layer containing at least one material selected from the group consisting of zirconium, hafnium, cerium, vanadium, chromium, and niobium; [emphasis added by Applicants]

As such, Applicants' claims required, among other limitations, **an adhesion layer disposed between the base substrate and the barrier layer**. This can be seen in Fig. 1C of the instant application, wherein the adhesion layer 20 is located between the barrier layer 30 and the base substrate 5. However, the **BERATAN** reference fails to teach or suggest, among other limitations of Applicants' claims, an adhesion layer being provided **between** the base substrate and the barrier layer, as required by Applicants' claims.

More particularly, in **BERATAN** the adhesion-promoting layer 310 of **BERATAN** is **not** provided between the base substrate 300, 302 of **BERATAN** and the barrier layer 308 of **BERATAN**. Rather, as shown in Fig. 3 of **BERATAN**, the adhesion-promoting layer 310 of **BERATAN** is provided **on top of both of** the substrate 300, 302, and the barrier layer 308, as the barrier layer 308 is formed in the trenches/openings of the layer 302 of **BERATAN**. As such, **BERATAN** fails to teach or suggest, among other limitations of Applicants' claims, an adhesion layer **between** the base substrate and the barrier layer, as required by Applicants' claims.

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Further still, Applicants' claims require, among other limitations:

a metal silicide layer disposed on said base substrate directly between said adhesion layer and said opening, causing a layer stack of said metal silicide layer, said adhesion layer and said oxygen-containing barrier layer to be formed above said opening. [emphasis added by Applicants]

As such, Applicants' claims require, among other limitations, a metal silicide layer disposed on the base substrate directly between the adhesion layer and an opening. This is shown in Fig. 1A of the instant application, wherein the metal silicide layer 9 is provided on the base substrate 5 and directly between the adhesion layer 20 and the opening 10. However, in contrast to Applicants' claimed invention, the **BERATAN** reference fails to teach or suggest the above limitation, among other limitations of Applicants' claims. More particularly, in **BERATAN**, the metal silicide layer 307 of **BERATAN** is not provided on the base substrate 300, 302, but within (i.e., and not on) the opening/trench. Additionally, the metal silicide layer 307 of **BERATAN** is not provided directly between the adhesion-promoting layer 310 of **BERATAN** and the opening, as required by Applicants' claims. Rather, in **BERATAN**, the metal silicide layer 307 of **BERATAN** is located between the plug 306 of **BERATAN** and the barrier layer 308 of **BERATAN**.

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As such, **BERATAN** fails to teach or suggest, among other limitations of Applicants' claims, a metal silicide layer disposed on the base substrate directly between the adhesion layer and an opening.

Additionally, Applicants' claims require, among other limitations:

a metal silicide layer disposed on said base substrate directly between said adhesion layer and said opening, **causing a layer stack of said metal silicide layer, said adhesion layer and said oxygen-containing barrier layer to be formed above said opening.** [emphasis added by Applicants]

As such, Applicants' claims require, among other limitations of Applicants' claims, other limitations, a layer stack of the metal silicide layer, **the adhesion layer and the oxygen-containing barrier layer to be formed above the opening.** This can be seen from Fig. 1C of the instant application, showing the metal silicide layer 9, the adhesion layer 20 and the barrier layer 30 being formed above the opening 10. In contrast to Applicants' claimed invention, in **BERATAN**, the barrier layer 308 of **BERATAN** is not formed above the opening/trench. Rather, in **BERATAN**, **the barrier layer 308 is formed in the opening/trench.** As such, among other limitations of Applicants' claims, **BERATAN** fails to teach or suggest a layer stack of the metal silicide layer, the

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**adhesion layer and the oxygen-containing barrier layer to be**  
**formed above the opening**

For the foregoing reasons, among others, Applicants' claims are believed to be patentable over the **BERATAN** reference.

It is accordingly believed that none of the references, whether taken alone or in any combination, teach or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

In view of the foregoing, reconsideration and allowance of claims 1, 2, 4, 10, 12, and 14 - 16 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

If an extension of time for this paper is required, petition for extension is herewith made.

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Please charge any fees that might be due with respect to  
Sections 1.16 and 1.17 to the Deposit Account of Lerner  
Greenberg Stemer LLP, No. 12-1099.

Respectfully submitted,



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For Applicants

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